Ethernet Remote I/O F&eIT N Series
Isolated Digital Input/Output Unit

DIO-1616LN-FIT

RoHS Compliant

* Specifications, color and design of the products are subject to change without notice.

This product is an isolated digital input and output unit of F&eIT remote I/O system that realizes monitoring and control of devices scattered remotely, through PCs connected to Ethernet. Since existing network infrastructure can be used, the system can be built easily by just connecting with LAN cables.
It is possible to connect external devices, such as adjacent switches, lamps and LEDs, to perform input/output of digital signals.
Compact design not restricting installation location (188.0(W) x 78.0(D) × 30.5(H)) makes it easy to install the product within the panel or device using DIN rail mounting jigs, or on the floor or wall.
Windows driver library is supplied. It is possible to confirm the operations through the diagnosis monitor without any programming.
This product has the 16ch of Optocoupler isolated inputs and 16ch of Optocoupler isolated open-collector outputs (input : 12 - 24VDC specification, output : 12 - 48VDC specification).
Input section corresponds to both of current sink and current source outputs. The output rating is max. 24VDC, 150mA or 48VDC, 50mA per ch.

Features

Optocoupler isolated inputs (for use with current sink output / current source output), Optocoupler isolated open-collector outputs (current sink type)
This product has the 16ch of Optocoupler isolated inputs (for use with current sink output / current source output) and 16ch of Optocoupler isolated open-collector outputs (current sink type).
The output rating is max. 24VDC, 150mA or 48VDC, 50mA per ch. Common terminal provided per 8ch, capable of supporting a different external power supply. You can check the digital input or output by using the LED indicator.

Optocoupler bus isolation
As the Ethernet controller (PC) side is isolated from the input and output interfaces by Optocouplers, this product has excellent noise performance.

This product has a digital filter to prevent wrong recognition of input signals from carrying noise or a chattering.
This product has a digital filter to prevent wrong recognition of input signals from carrying noise or a chattering. All input terminals can be added a digital filter, and the setting can be performed by software.

Fail safe function
When communication failure occurs, such as LAN cable disconnection, it is possible to notify the external devices by outputting a specific user-defined signal pattern.

Compact design not restricting installation location (188.0(W) x 78.0(D) x 30.5(H))
Compact design of 188.0(W) × 78.0(D) × 30.5(H) does not require special installation location.

Compatible with a wide range of power supplies : 5 to 24VDC
Compatible with a wide range of power supplies : 5 to 24VDC, and can be used in various environments.
An FG terminal is also provided in the power connector. Furthermore, it is possible to screw fit the power connector on to the body to prevent detachment.

Can be used as digital input/output of Ethernet base remote I/O
As the control (monitoring and control) of digital input/output is performed via Ethernet, remote control can be easily performed.

Diverse installations such as screw fastening, magnet, DIN rail are possible
Installation on the floor / wall /ceiling is possible by screw fastening, magnet, rubber feet, etc.
In addition, DIN rail mounting mechanism is equipped as standard with the product, making it easy to install the product within the panel or the device.

Windows compatible driver libraries are attached.
Using the attached driver library makes it possible to create applications of Window. As the driver library was designed taking into consideration compatibility with the API functions [API-PAC(W32)] of the measurement control and communication interface board, if you have experience in these applications, smooth programming is possible.
In addition, a diagnostic program by which the operations of hardware can be checked is provided.
In addition, using generic socket functions makes it possible to implement control under OS other than Windows, such as UNIX machine.

Specification

Specifications < 1 / 2>

Item			Specifications
Input section			
	Input format		Optocoupler isolated input (compatible with current sink output and current source output)
	Input resistance		4.7kΩ
	Input ON current		2.0mA or more
	Input OFF current		0.16mA or less
	Number of input signal channels		16 channels (8 channels / common)
	Response time		Within 1msec
	External circuit power supply		12 - 24 VDC (±15%) (2.5 mA / 12V, 5 mA / 24V per channel)
Output section			
	Output format		Optocoupler isolated open collector output (current sink type)
	Ratings	Output voltage	12 - 48VDC (±15%)
		Output current	150 mA (12 - 24V) (per channel) (Max.) 50 mA (36 - 48V) (per channel) (Max.)
	Number of output signal channels		16 channels (8 channels / common)
	Response time		Within 1msec
	External circuit power supply		12 - 48VDC (±15%)
Common section			
	Allowable distance of signal extension		Approx. 50m (depending on wiring environment)
	Applicable wire		AWG28 - 16
	Applicable plug		AK1550 / 10-3.5-GREEN (mfd. by PTR)

Specifications < 2 / 2>

Item	Specifications
LAN	10/100BASE-TX(IEEE802.3u)
Power voltage	5 - 24VDC±10% supply from 2-piece power input detachable type connector It is recommended that you use F&eIT series power unit or stabilized power product on the market. Maximum extension between power device and the product : 1.5m
Current consumption (Max.)	5VDC 0.60A, 12VDC 0.26A, 24VDC 0.14AA
FG pin	Power supply connector equipped with a FG pin.
Power input connector	2-piece power input detachable type connector with an FG terminal supplied Uses connector : MC1,5/3-GF-3,5 (mfd by Phoenix Contact) The dedicated plug, with screw fastening that can be operated from the side, is supplied as standard Compatible connector : MC1,5/3-STF-3,5 (mfd by Phoenix Contact) Compatible cable : AWG28-16
Physical dimensions (mm)	188.0(W) x 78.0(D) x 30.5(H) (No protrusions)
Weight	220g (Only the unit)
Installation method	One-touch connection to 35mm DIN rails DIN rail mounting mechanism as a standard feature. Mounting to the wall using the screws Mounting to a metal surface using the magnets Mounting to the floor using the rubber feet

Installation Environment Requirements

Item		Requirement description
Operating temperature		0 - 50°C *1
Operating humidity		10 - 90%RH (No condensation)
Floating dust particles		Not to be excessive
Corrosive gases		None
Noise immunity	Line-noise *2	AC line / 2kV, Signal line / 1kV (IEC1000-4-4Level 3, EN61000-4-4Level 3)
	Static electricity resistance	Contact discharge / 4kV (IEC1000-4-2Level 2, EN61000-4-2Level 2)
		Atmospheric discharge / 8kV (IEC1000-4-2Level 3, EN61000-4-2Level 3)
Vibration resistance	Sweep resistance	10 - 57Hz / semi-amplitude 0.15mm, 57 - 150Hz / 2.0G
		40minutes each in X, Y, and Z directions (JIS C60068-2-6-compliant, IEC60068-2-6-compliant)
Impact resistance		15G half-sine shock for 11ms in X, Y, and Z directions (JIS C60068-2-27-compliant, IEC60068-2-27-compliant)
Grounding		Class D grounding (previous class 3 grounding)

*1 When using the attached AC adaptor POA201-10-2, it is 0 - 40°C
*2 When using a POA201-10-2

Support Software

API-CAP(W32)
[Stored on the bundled CD-ROM F&eIT Series Setup Disk]

The API-CAP(W32) is the Windows version driver library software that provides products in the form of Win32 API functions (DLL). Various programming languages such as Visual Basic and Visual C++ can be used to create high-speed application software which maximizes the features of the F&eIT module. In addition, a diagnostic program, which is useful for operation verification, is also provided.

< Operating environment >

OS Windows 7, Server 2008, Vista, XP, 2000., etc

Adaptation language Visual C++, Visual Basic., etc

For more details on the supported OS, applicable language and how to download the updated version, please visit the CONTEC's Web site (http://www.contec.com/).

Option list

POA201-10-2 : AC adapter
(input : 90 - 264VAC, output : 12VDC 1.0A)

POA200-20-2 : AC adapter
(input : 90 - 264VAC, output : 5VDC 2.0A)

POW-AD13GY : AC-DC power unit
(input : 85 - 132VAC, output : 5VDC 3.0A)

POW-AD22GY : AC-DC power unit
(input : 85 - 264VAC, output : 5VDC 2.0A)

POW-DD10GY : DC-DC power unit
(input : 10 - 30VAC, output : 5VDC 3.0A)

POW-DD43GY : DC-DC power unit
(input : 30 - 50VAC, output : 5VDC 3.0A)

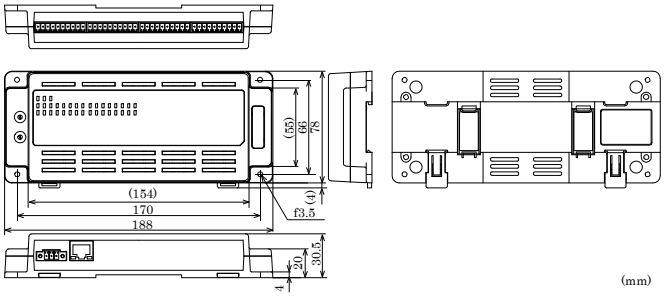
* Check the CONTEC's Web site for more information on these options.

Packing List

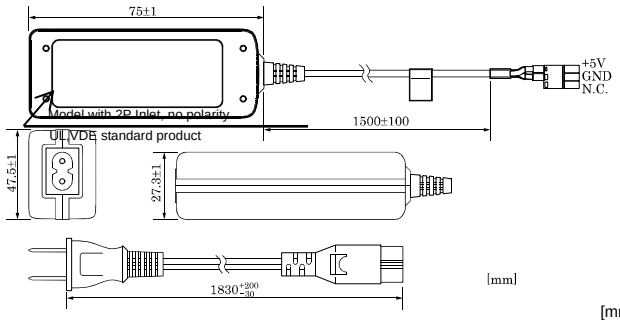
Unit [DIO-1616LN-FIT] …1
First step guide … 1
Power connector …1
I/O connector …4
Rubber feet …4
Magnet …2
CD-ROM [F&eIT Series Setup Disk] *1 …1

*1 The CD-ROM contains various software and User's Manual.

Physical Dimensions

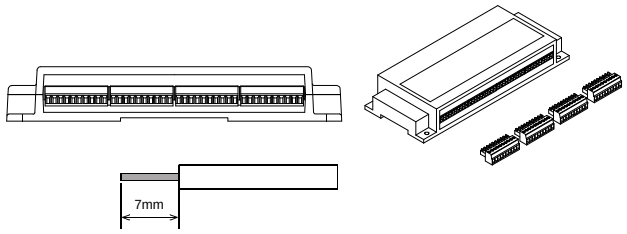


Physical Dimensions<AC Adapter POA201-10-2(Option)>



Connecting an Interface Connector

When connecting the unit to an external device, you can use the supplied connector plug. When wiring the unit, strip off approximately 7 mm of the covering for the cable, and insert the bare wire by pressing the orange button on the connector plug. Releasing the orange button after the wire is inserted fixes the cable. Compatible wires are AWG 28 - 16.



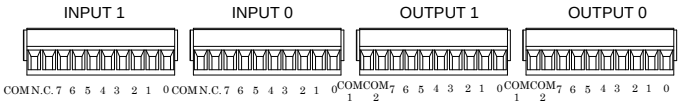
- Connector used :
  3.5mm pitch, 10 pin type of rated current 9.0A
  STL1550/10G-3.5-H-GREEN [mfd. by PTR]
- Compatible plug (supplied) :
  AK1550/10-3.5-GREEN [mfd. by PTR]
  Compatible wires : AWG28-16

⚠ CAUTION
Removing the connector plug by grasping the cable can break the wire.

Signal Layout on the Interface Connector

The unit can be connected to an external device using 10-pin connectors that is provided on the unit face.

Connector : 4



Pin No.		Signal name	Logical bit	Logical port	Contents
INPUT0	0	IN00	0	0	Input
	1	IN01	1		
	2	IN02	2		
	3	IN03	3		
	4	IN04	4		
	5	IN05	5		
	6	IN06	6		
	7	IN07	7		
	N.C.	N.C.	–	–	Not connected
	COM	COM	–	–	Plus / minus common for INPUT0
INPUT1	0	IN10	8	1	Input
	1	IN11	9		
	2	IN12	10		
	3	IN13	11		
	4	IN14	12		
	5	IN15	13		
	6	IN16	14		
	7	IN17	15		
	N.C.	N.C.	–	–	Not connected
	COM	COM	–	–	Plus / minus common for INPUT1

Pin No.		Signal name	Logical bit	Logical port	Contents
OUTPUT0	0	OUT00	0	0	Output
	1	OUT01	1		
	2	OUT02	2		
	3	OUT03	3		
	4	OUT04	4		
	5	OUT05	5		
	6	OUT06	6		
	7	OUT07	7		
	COM0	COM(-)	–	–	Minus common for OUTPUT0
	COM1	COM(+)	–	–	Plus common for OUTPUT0
OUTPUT1	0	OUT10	8	1	Output
	1	OUT11	9		
	2	OUT12	10		
	3	OUT13	11		
	4	OUT14	12		
	5	OUT15	13		
	6	OUT16	14		
	7	OUT17	15		
	COM0	COM(-)	–	–	Minus common for OUTPUT1
	COM1	COM(+)	–	–	Plus common for OUTPUT1

IN00 - 17	16 input signal pins. Connect output signals from the external device to these pins.
OUT00 - 17	16 output signal pins. Connect these pins to the input signal pins of the external device.
N.C.	This pin is left unconnected.
COM	Connect the positive or negative side of the external signal. These pins are common to 8 input signal pins.
COM0	Connect the negative side of the external signal. These pins are common to 8 output signal pins.
COM1	Connect the positive side of the external signal. These pins are common to 8 output signal pins.

Connecting Input Signals

Input Circuit

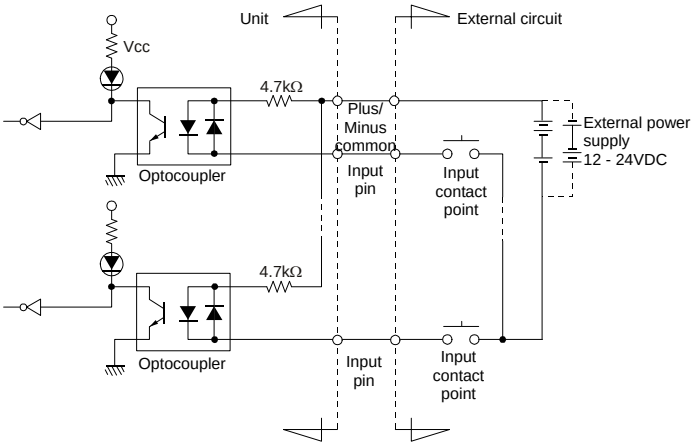
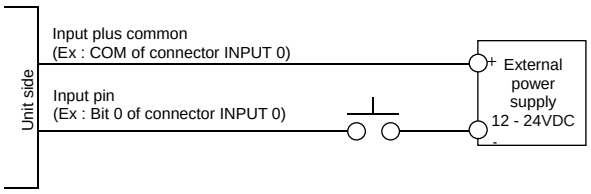


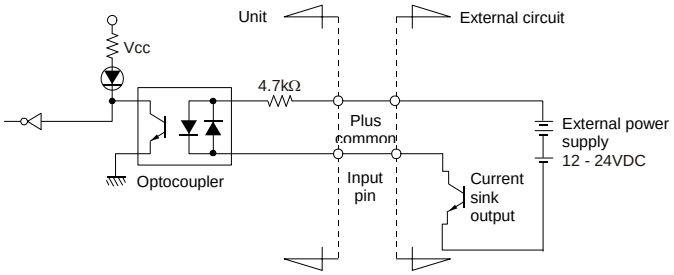
Figure above shows the input equivalent circuit for the interface section of this product.
The signal input section consists of an Optocoupler isolated input (compatible with both current sink output and current source output). An external power supply is therefore required to drive the input section of this unit. The power requirement is about 5 mA per input channel at 24 VDC (about 2.5 mA at 12 VDC).

Connecting a Switch

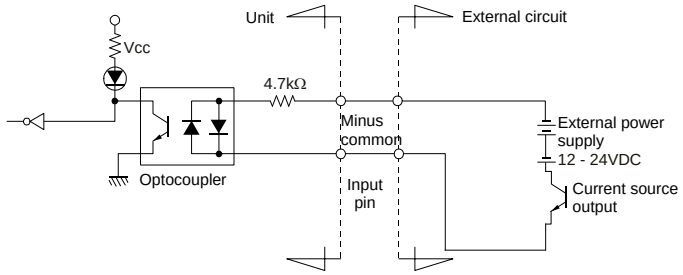


Examples of Connection to an External Device

Example of a Connection between Input and Current Sink Output



Example of a Connection between Input and Current Source Output



Connecting Output Signals

Output Circuit

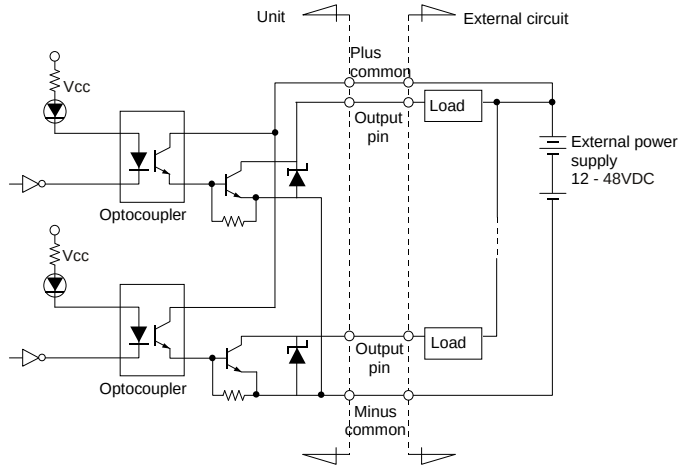
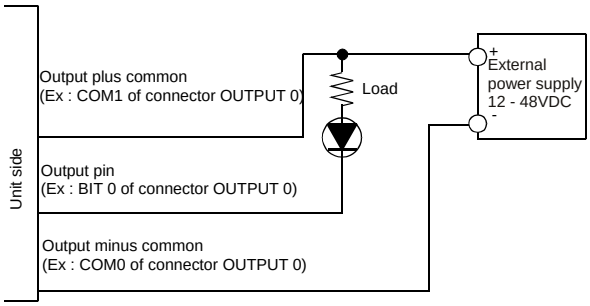


Figure above shows the output circuit for the interface section of this product. The signal output section consists of an Optocoupler isolated open collector output (current sink type). An external power supply is therefore required to drive the output section of this unit.
The maximum output current rating per channel is 150 mA (at 12 - 24 VDC) or 50 mA (at 36 - 48 VDC). A surge voltage protection circuit (zener diode) is provided for the output transistors of this unit. When the unit drives relays, lamps, and other induction loads, however, another surge voltage countermeasure should be provided on the load side.

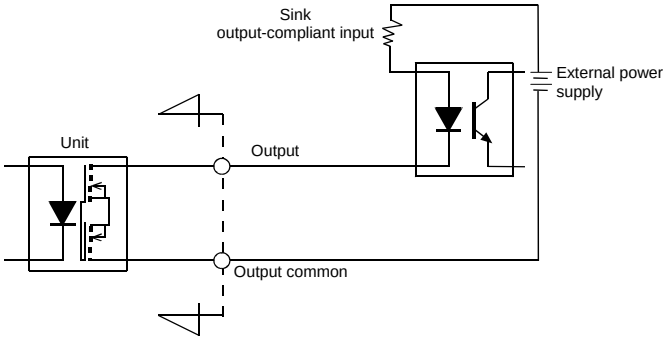
⚠ CAUTION
When the power is turned on, all output will be OFF.

Connection to the LED

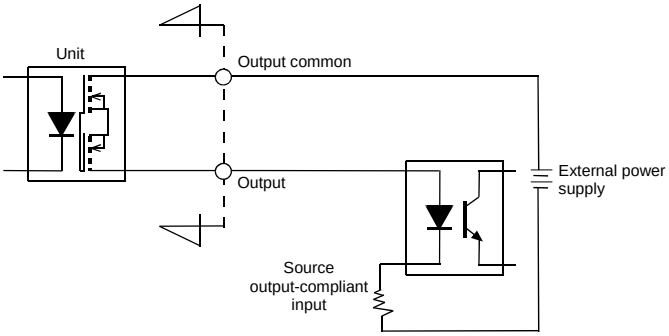


Examples of Connection to an External Device

Example of a Connection between Output and Current Sink Input

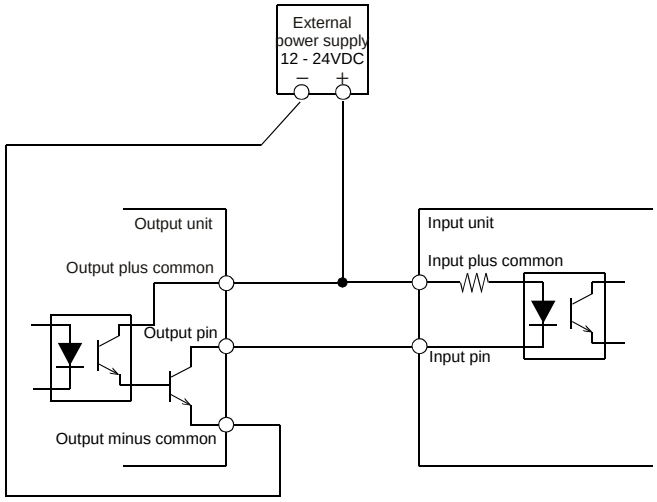


Connection Method between Output and Source Output-Compliant Input



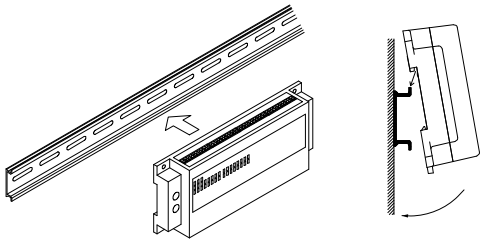
Example of a Connection between Input and Output Unit

Figure below shows the example of a connection between input pin of input unit and output pin of output unit.



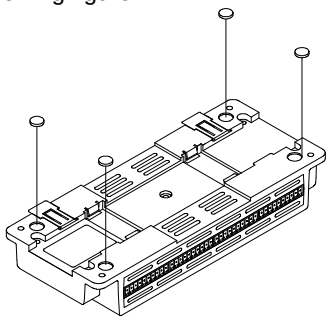
Installation Method

Mounting on a DIN Rail



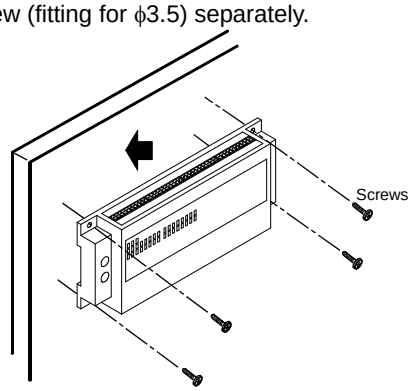
Desktop Installation

When required to mount the product on the desktop, mount it on a horizontal platform.
The rubber feet can be mounted in their mounting holes as shown in the following figure.



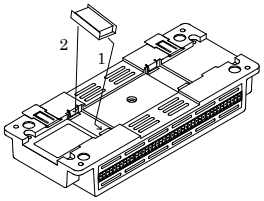
Wall Installation

To mount the product on the wall, purchase the commercially available screw (fitting for ϕ3.5) separately.

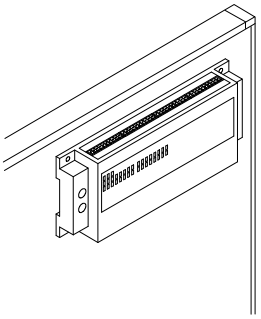


Installation Using the Magnet

Attaching the magnet supplied with the product makes it easy to mount or remove the product on or from a metal surface such as steel desk or partition.



Example of a Mounting on the partition



Installation Condition

Spacing between the system unit and any surrounding objects

Secure a distance of at least 50mm between the top of the main unit (single use) and any surrounding objects.
Do not locate the unit in a fully enclosed housing.
It is possible to mount it in the orientations shown in the following figure. Other orientations would cause problems in usage, such as inadequate heat dissipation.